

THE UNITED REPUBLIC OF TANZANIA  
PRESIDENT'S OFFICE  
REGIONAL ADMINISTRATION AND LOCAL GOVERNMENT



LAKE ZONE FORM FOUR MOCK EXAMINATION  
(GEITA, KAGERA, MARA, SIMIYU, SHINYANGA AND MWANZA)

032/1

**CHEMISTRY 1**

(For Both School and Private Candidates)

Time: 3Hours

Year: 2025

**INSTRUCTIONS**

1. This paper consists of three section A, B and C with total of eleven (11) questions
2. Answer all questions in section A and B and only two (2) questions for section C
3. Section A carries sixteen (16) marks, section B carries fifty-four (54) marks and section C carries thirty (30) marks
4. Non programmable calculators may be used
5. Cellular phones and any unauthorized materials are not allowed in the examination room
6. Write your examination number on every page of your answer sheet(s) provided.
7. The following constants may be used

Atomic Masses

H=1, C=12, N=14, O=16, Na=23, Cl=35.5, Ca=40,

Mg=24, S=32, Ag=108, Cu=64, Fe=56, pb=208

Avogadro's constant/number (LA) =  $6.20 \times 10^{23}$

G.M.V at S.T.P =  $22.4 \text{ dm}^3/\text{mol}$

Specific heat capacity of water =  $4.18 \text{ KJ}^\circ\text{C}^{-1}$

1 Faraday = 96500 Coulombs

1 litre =  $1 \text{ dm}^3 = 1000 \text{ cm}^3$

Density of water =  $1000 \text{ kg/m}^3$

This paper consists of 4 printed pages

**SECTION A: (16 MARKS)**

**Answer all questions in this section**

1. For each of the item(s) (i) – (x), choose the correct answer from among the given alternatives and write its letter beside the item number in the answer sheet(s) provided
- (i) Calcium chloride crystals on a watch glass left overnight in the laboratory. Eventually a solution was found in the watch glass, this suggests that this compound is
- A. Efflorescent B. Hygroscopic ( )  
C. Deliquescent D. Solute E. Sublime
- (ii) Form three students were setting for titration of sulphuric acid against Ammonia solution. Which suitable indicator should be used?
- A. Litmus paper B. Universal indicator ( )  
C. Methyl orange D. Phenolphthalein E. Bromothymol indicator
- (iii) Suffocation is a condition in which the lungs .....
- A. Do not exhale enough oxygen B. Do not inhale enough oxygen ( )  
C. Do not inhale enough carbon dioxide D. Do not exhale enough nitrogen  
E. Do not exhale enough carbon dioxide
- (iv) The burns caused by hot liquid or vapour are called .....
- A. Wound B. Scalds ( )  
C. Scars D. Accident E. Injuries
- (v) Organic compound Y has one carbon atom and can decolorize bromine water only in presence of light. Compound Y belong to which homologous series with general formula?
- A.  $C_nH_{2n+2}$  B.  $C_nH_{2n}$  ( )  
C.  $C_nH_{2n+1}$  D.  $C_nH_{2n+1}OH$  E.  $C_nH_{2n-2}$
- (vi) An electric current of 0.2A was passed through an electrolyte for 16.67 minutes. The quantity of electricity passed is .....
- A. 200.04 C B. 200.004 C ( )  
C. 1000 C D. 0.254 C E. 0.00789 C
- (vii) An element in the periodic table with atomic number 18 belongs to which of the following?
- A. Group I and period 1 B. Group II and period 3 ( )  
C. Group VIII and period 3 D. Group V and period 4  
E. Group VII and period 4
- (viii) What will happen if white anhydrous copper (II) sulphate will be exposed to atmosphere for two days?
- A. It will change pink B. It will start to form blue crystals ( )  
C. It will become a colorless D. It will turn a litmus paper neutral  
E. Nothing will happen
- (ix) What should be done if the results obtained from an experiment do not support the hypothesis?
- A. The experiment should be changed B. The results should be left out  
C. Ideas for further testing to find a solution should be given ( )  
D. Identify new problems E. More observation should be done

(x) When methane undergoes substitution reaction with excess chlorine gas. What is the final product?

A. Chloromethane

B. Dichloromethane

( )

C. Tetra chloromethane

D. Monochloromethane

E. Trichloromethane

2. Match the items in list A with the response in list B by writing the letter of the corresponding responses to the answer sheet(s)

| LIST A                               | LIST B                                                                                                      |
|--------------------------------------|-------------------------------------------------------------------------------------------------------------|
| (i) Destructive distillation of coal | A. It happens in presence of $\text{CO}_2$<br>B. Occurs in absence of air (oxygen)<br>C. Ammonia and butane |
| (ii) Water gas                       | D. Water gas and ammonia                                                                                    |
| (iii) Producer gas                   | E. Renewable sources of energy                                                                              |
| (iv) Natural gas                     | F. Gases fuel derived from decomposition of biological waste                                                |
| (v) Biomass                          | G. Industrial gases fuel which is a mixture of nitrogen gas, hydrogen and carbon monoxide                   |
| (vi) Biogas                          | H. Non-renewable gaseous fuel<br>I. Industrial gas which is a mixture of hydrogen and carbon monoxide       |

### SECTION B: (54 MARKS)

Answer all questions in this section

3. (a) Explain the following statements

(i) Chemistry laboratory have fume chamber? (ii) Laboratory door is open outward

(iii) Sodium metal is stored under oil (iv) Ethanol should not be placed near the naked flame

(v) Laboratory floor should not be polished

(b) Give four (4) examples of chemistry laboratory apparatus made up by ceramic materials.

4. (a) In an experiment, a sample of chlorine gas was found to contain 92.2% of isotope  $^{28}\text{X}$ , 4.7% isotope  $^{29}\text{X}$  and 3.1% of isotope  $^{30}\text{X}$ . Using that information calculate the relative atomic mass of element X.

(b) 16.8g of impure sodium hydroxide was dissolved in distilled water to make  $1000\text{cm}^3$ .  $20\text{cm}^3$  of this solution required  $28\text{cm}^3$  of 0.07M sulphuric acid to react. Calculate,

(i) Molarity of sodium hydroxide (ii) Percentage purity of sodium hydroxide

5. (a) Why is Bunsen burner a preferable source of heat in chemistry laboratory? Give four points

(b) Suggest other five (5) sources of heat that can be used in a chemistry laboratory apart from Bunsen burner

6. (a) You are provided with elements X and Y having atomic numbers 12 and 17 respectively.

(i) Write the chemical formula of the compound formed by the combination of X and Y

(ii) Mention the type of bond formed between element X and Y

(iii) State three properties of the compound formed between elements X and Y

(b) The following organic compounds are incorrectly named give their structural formula and then rename them correctly

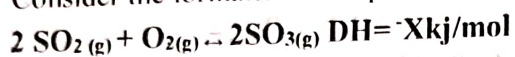
(i) But -3-ene

(ii) 1,1,1,1,-tetramethylmethane

(iii) 2,3-methylbutane

(iv) 3-chloro-2-methylbutane

7. (a) Consider the formation of sulphur trioxide using the reversible reaction



In order to obtain maximum yield of sulphur trioxide at equilibrium it is necessary to control the conditions very carefully.

- (i) State with reason whether a high or low temperature should be used
- (ii) State with reasons if any increase in pressure would have effect on the equilibrium and yield
- (iii) State with reason what effect if an increase on pressure would have on rate of the reaction
- (iv) The sign of enthalpy change of the reaction is negative; what does type of reaction means?

(b) Name and state the law applied in 7(a) above

8. (a) A form two student was given two gas jars, one containing gas "A" and another one containing gas "B". Gas "A" is used to prepare water gas in the laboratory and gas "B" is used for treating sewage plants.

- (i) Identify the gas A and B
- (ii) With two reasons name the method used to collect gas "B" in the laboratory
- (iii) Suggest three (03) uses of gas "A"

(b) Explain how extraction of metals is applied to;

- (i) Agriculture
- (ii) Construction

### SECTION C: (30 MARKS)

Answer two (2) questions in this section

9. Addition of inorganic fertilizers in the farm is not important as addition of organic manure, discuss this statement. (Give six point)

10. (a) Sulphuric acid is very important in industry. It is manufactured in large scale through contact process. With the aid of balanced chemical equation, explain stages in industrial manufacturing of sulphuric acid.

(b) With three (03) reasons explain why sulphuric acid is importance.

11. (a) Explain the meaning of energy value

(b) List three examples of renewable energy sources and five examples of non-renewable energy sources

(c) The following results were obtained in an experiment to measure the heat value of biodiesel

Initial temperature of matter ( $T_0$ ) =  $24.7^\circ\text{C}$

Final temperature of water ( $T_1$ ) =  $68.5^\circ\text{C}$

Mass of biodiesel burnt = 56g

If the volume of water used in the experiment was 12 litres, determine the heat value of the biodiesel. Specific heat capacity of water =  $4.18\text{kJkg}^{-1}\text{K}^{-1}$  density of water =  $1000\text{kg/m}^3$ .